a rejuvenation is here called *static rejuvenation.*

It may be further stated that the region of the Muscatatook River to the north still possesses just such a local base-leveled plain that existed in the New Albany locality. It is inferred that the stream which the Ohio dispossessed was somewhat near the size of the Muscatatook-White River. This stream possesses a gradient in its graded condition slightly less than one foot to the mile, while the Ohio has a gradient below New Albany slightly less than three inches to the mile. It would appear than such a change in gradient would allow a trenching of something like 90 feet, which is approximately the amount of the dissection of the local peneplain in the vicinity of New Albany, using the flood plain as the present local base-level. This figure is derived by taking the difference between the gradients of the Ohio and its assumed predecessor from New Albany to Cannelton, a distance of approximately 120 miles. In the lattitude of Cannelton valley filling begins to be rather conspicuous, and this nullifies any difference in the gradients of the former and the present streams, assuming that the valley filling of southwestern Indiana and associated regions took place during the pleistocene. A still further check both on the postulated static rejuvenation and its amount is found in the peculiar gradients of the streams emptying into the Ohio between New Albany and Cannelton. The gradients are approximately as high in their lower reaches as in their middle and upper courses. This is conspiciously true of Blue River and Indian Creek. Other complications however, enter into the full explanation of these peculiar gradients, making this a problem in itself.

The above statement of the conditions and such an explanation are ventured here for the first time. It is thought that the principle of static rejuvenation may have a wider application than the case here given. The writer would further suggest that its application be made in certain piracy cases.

CLYDE A. MALOTT

INDIANA UNIVERSITY

THE AMERICAN CHEMICAL SOCIETY.

II

COLLOID SYMPOSIUM

W. D. Harkins and Harry N. Holmes, *Joint Chairman*

Some practical applications of colloid chemistry: JEROME ALEXANDER.

Gelatinous precipitates: WILDER D. BANCROFT.

The colloid chemistry of soaps: MARTIN H. FISCHER.

Vegetable tanning as a colloid chemical process: JOHN ARTHUR WILSON. Vegetable tanning is the reaction taking place between the collagen of hide and the water-soluble matter extracted from certain vegetable materials and known as tannin. Collagen is not built up of individual molecules, but of chains of atoms forming a three-dimension network with interstices sufficiently large to permit the passage of all ordinary molecules and ions. Under the conditions obtaining in practise, collagen has a positive electrical charge and the solution absorbed in the interstices has a difference of potential against the unabsorbed portion of the tan liquor. The tannin particles are negatively charged and the thin film of solution immediately in contact with the surface of the particles has a potential difference against the bulk of the tan liquor, but of sign opposite to that in the case of collagen. This surface film of solution and the solution absorbed by the collagen tend, therefore, to merge, and when this occurs, the positively charged collagen and negatively charged tannin neutralize each other by combination, forming leather. The fact of practical importance is that the potential differences referred to, and therefore the rate of tanning, can be altered without necessarily altering the absolute values of the electrical charges.

Ceramic processes associated with colloid phenomena: A. V. BLEININGER. Clays are mixtures of finely divided aluminum silicate, of the type $Al_2O_3 2SiO_2 2H_2O$ with granular matter, such as quartz, feldspar, mica, etc., and other colloids like ferric oxide and hydroxide. The particles are of the magnitude of 5μ, or smaller. Clay suspended in water is affected in a pronounced manner by alkalies, salts and acids. The former tend to deflocculate it, the latter two cause coagulation. Both phenomena occur in phases. Absorption of the basic ion of salts is characteristic, the acid ion remaining in the dispersing medium. Deflocculation is employed in the purification of clays and in the casting process. Measurements of the fluidity

of clay suspensions offer the most convenient means of detecting the change caused by the presence of reagents, though the distinction made by Bingham between viscous and plastic flow must be kept in mind. In the firing of clay, contraction of the external volume takes place due to the effect of surface tension and the lowered viscosity upon heating. With maximum contraction and closing of the pore space the state of vitrification is reached. The mass of the clay itself undergoes expansion upon heating irrespective of the external contraction. The relation between temperature, time and contraction is a most valuable one for expressing the heat work done upon clays and other silicates and oxides. Vapor pressure likewise is a probable factor in the condensation of substances like magnesia, coal, carbon, etc., or in mixtures of inert oxides with those of higher vapor tension. The end result of the heating process tends toward the partial elimination of the colloid and the substitution of the anisotropic phase.

Surface energy: W. D. Harkins.

Nomenclature in colloid chemistry. A plea for reform: Arthur W. Thomas.

ORGANIC DIVISION

E. Emmet Reid, *Chairman*

Rodger Adams, *Secretary*

Methyl amines from carbinol and ammonium chloride, equilibria involved: W. D. Turner and A. M. Howald. Ammonium chloride and carbinol with and without the addition of fused zinc chloride were maintained at elevated temperatures in steel bombs by immersing in the vapors of constant boiling liquids. The products were analyzed for the three methyl ammonium chlorides, ammonium chloride and carbinol. Using zinc chloride as a dehydrating agent, mono-methyl ammonium chloride was obtained up to 50 per cent. of the ammonium chloride present di-methyl ammonium chloride up to 10 per cent. and tri-methyl ammonium chloride up to 4 per cent. of the ammonium chloride present. The methods of separation and estimation of the four bases are given together with tables of the equilibria reached, a summary of the results obtained and a brief bibliography.

The synthesis and physical constants of benzene and toluene sulphonamides: K. K. Kershner and W. D. Turner. The sulphonamides of benzene and toluene are prepared synthetically from benzene and toluene. This is accomplished by sulphonating the benzene and toluene, forming the sodium salt by the addition of sodium chloride, preparing the sulphonchloride by means of phosphorus pentachloride, and securing the sulphonamide by treatment with concentrated ammonia. Duplications of this process are made and comparative data taken on the yields of the different compounds formed at the conclusion of each step of the synthesis. The sodium salts are purified by centrifuging and by recrystallization from alcohol and the sulphonamides by centrifuging and by recrystallization from both concentrated ammonia and alcohol. Solubility data at different temperatures is taken on the sodium salts of benzene and toluene and on their corresponding sulphonamides with reference to absolute alcohol and pure water. A summary, giving the salient points of the work, and a bibliography, covering the literature on the subject, are given.

A sulphide alcohol: T. C. Whitner, Jr., and E. Emmet Reid. By action of ethylene chlorhydrin on sodium salt of butyl mercapton the alcohol

$$CH_3CH_2CH_2CH_2SCH_2CH_2OH$$

is obtained. This alcohol and its esters and halide derivatives have been studied and shown to be quite similar in many properties to the higher alcohols of about the same molecular weights.

A sulphide acid: K. Uyeda and E. Emmet Reid. By action of sodium chloracetate on sodium salt of butyl mercapton the acid

$$CH_3CH_2CH_2CH_2SCH_2COOH$$

is formed. This acid is readily obtained and is found to be similar in properties to the parafine acids of about the same molecular weight. The methyl, ethyl, prophyl and butyl esters and a number of salts of this acid have been prepared.

Heterocyclic compounds of n-arylamino alcohols: R. E. Rindfusz and V. L. Harnack. (1) Cyclic nitrogen compounds may be formed by the dehydration of *N*-arylamino alcohols. (2) Where six-membered rings may be so formed, the dehydration takes place closing a side ring into the benzene nucleus. (3) Where a five-membered ring would be formed as a side ring annealed to the benzene nucleus, the preference is to form a six-membered ring outside. This is unlike the behavior of analogous oxygen compounds. (4) The reaction of nitrogen compounds has not been carried out in enough cases to show that these inferences are general.

The automatic separator in organic preparations: I. N. HULTMAN, ANNE W. DAVIS and H. T. CLARKE. Principle of automatic separator. Separation of butyl alcohol or amyl alcohol and water. Steam distillation of aniline and similar liquids. Preparation of anhydrous oxalic acid, butyl ether, butyl oxalate, trimethylene chlorohydrin, and glycerol dichlorohydrin.

Some condensed rings containing arsenic: W. LEE LEWIS and W. V. EVANS. Oxydiphenylene chlor arsine is prepared by a modification of Pope's method condensing diphenyl ether and arsenic chloride in the presence of aluminium chloride. With the Grignard reagent mixed arsines of the type oxydiphenylene ethyl arsine are obtained. The brom, iodo, cyan, sulphocyan and hydrosulphide derivatives were prepared. Chlorination gave oxydiphenylene trichlorarsine which on careful hydrolysis gave the oxychloride. Bromination with subsequent hydrolysis yielded oxydiphenylene arsenic acid and its metal and alkaloidal salts. The condensation of diphenylmethane and diphenyl sulfide with arsenic chloride is being studied.

A cooperative pamphlet on organic chemical preparations: ROGER ADAMS, O. K. KAMM, H. T. CLARKE, J. B. CONANT. An annual pamphlet is to be published containing the detailed directions for the preparation of various reagents which may have been produced in the laboratories in which the above authors work. The directions are to be tested out in one of the other laboratories and not until the results can be duplicated are they to be published. A discussion of the reaction and bibliography of other methods of preparation are included. It is hoped that others who may be carrying on investigations in organic research will be willing to contribute methods of preparation for various reagents which they may have developed in detail in their laboratories. These will be tested out and published with the others.

The reaction between aldehydes and acid halides: ROGER ADAMS, H. E. FRENCH and L. H. ULICH. It has been shown that the reaction between aromatic acid halides and aliphatic or aromatic aldehydes and between aliphatic acid halides and aliphatic aldehydes to give compounds of the general formula RCOOCHXR is very general. Early work in this field showed that a number of aliphatic halides and aldehydes reacted together to give compounds of this type but until the above research was undertaken no substances were obtained between aromatic acid halides and aliphatic aldehydes with the exception of the compounds from benzoyl chloride and formaldehyde and no compounds from aromatic acid halides and aromatic aldehydes were produced with the exception of the compound from benzoyl bromide and benzaldehyde. The reaction between aliphatic acid halides and aromatic aldehydes does not seem to run so smoothly and results are not yet available on this point. These halogenated esters that are produced react in many cases merely like a mixture of the acid halides and aldehydes. In other cases, the halogens react like the halogens in alkyl halides.

The preparation and physiological action of oxazolidones and their decomposition into substituted B-amino ethyl alcohols: ROGER ADAMS and J. B. SEGUR. The oxazolidones are readily produced by condensing phosgene with ethylene chlorohydrin to give beta-chloroethyl chlorocarbonate. This is condensed with aniline to give the corresponding urethane derivative and then by treatment of this latter substance with alkali, the oxazolidone is produced as follows:

$$ClCOOCH_2CH_2Cl \rightarrow C_6H_5NHCOOCH_2CH_2Cl$$
$$\rightarrow C_6H_5N - COOCH_2CH_2.$$

If the oxazolidone is treated with excess of concentrated alkali or if the urethane derivative is treated directly with excess of concentrated alkali, very good yields of N-aryl amino alcohols are produced.

$$C_6H_5N - COOCH_2CH_2 \rightarrow C_6H_5 - NHCH_2CH_2OH.$$

The paraethoxy phenyl oxazolidone has about the same toxicity as phenacetin and as an antipyretic possesses slightly greater value than phenacetin.

CHARLES L. PARSONS,
Secretary

(To be continued)

THE NORTH CAROLINA ACADEMY OF SCIENCE

THE nineteenth annual meeting of the North Carolina Academy of Science was held April 30 and May 1, 1920, at the North Carolina State College of Agriculture and Engineering, West Raleigh, N. C. At the same time the spring meeting of the North Carolina Section of the American Chemical Society was held.

Among the more important business matters discussed and acted upon were those relating to the affiliation of the academy with the American Asso-